

What is claimed is:

Sub B1
1 1. An imaging module comprising:
2 a frame;
3 a circuit board mounted to said frame;
4 an image sensor carried by said circuit board; and
5 at least one illumination light source for illuminating a
6 target area.

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1 5. The imaging module of claim 1, wherein said circuit
2 board carries essentially all image sensor signal processing
3 circuitry, image capture circuitry, and decoding and or
4 recognizing circuitry of an optical reader in which said
5 module is to be installed.

1 6. The imaging module of claim 1, wherein said image
2 sensor is a 2D image sensor and wherein said module further
3 includes at least one aiming light source and associated
4 optics for projecting a solitary horizontal line aiming
5 pattern in a target area.

1 7. The imaging module of claim 1, wherein said frame
2 defines top and side sidewalls of said module, and wherein
3 said sidewalls and said circuit board define a cubic
4 rectangular configuration.

1 8. The imaging module of claim 1, wherein said frame
2 includes substantially rigid top and side sidewalls defining a
3 partially enclosed contained area, and wherein said at least
4 one illumination source is disposed inside said contained
5 area, whereby said at least one illumination source is
6 structurally protected by said frame.

1 9. The imaging module of claim 1, wherein said frame
2 includes substantially rigid top and side sidewalls defining a
3 partially enclosed contained area, and wherein said at least
4 one illumination source and said image sensor are disposed
5 inside said contained area, whereby said at least one
6 illumination source and said image sensor are structurally
7 protected by said frame.

1 10. The imaging module of claim 1, wherein said frame
2 includes substantially rigid top and side sidewalls, and
3 wherein a combination of said circuit board and said top and
4 side sidewalls defines a partially enclosed contained area,
5 and wherein said at least one illumination source is disposed
6 inside said contained area, whereby said at least one
7 illumination source is structurally protected by a combination
8 of said circuit board and said frame.

1 11. The imaging module of claim 1, wherein said frame
2 includes substantially rigid top and side sidewalls and
3 wherein a combination of said circuit board and said top and
4 side sidewalls defines a partially enclosed contained area,
5 and wherein said at least one illumination source and said
6 image sensor are disposed inside said contained area, whereby
7 said at least one illumination source and said image sensor
8 are structurally protected by a combination of said circuit
9 board and said frame.

1 12. The imaging module of claim 10 wherein essentially
2 an entirety of illumination sources of said module are
3 incorporated in said contained area.

Swan → 1 13. The imaging module of claim 1, wherein said back
2 plate includes a center recess for receiving and aligning said
3 image sensor.

1 14. The imaging module of claim 1, wherein said back
2 plate includes a center recess for receiving and aligning said
3 image sensor and at least one side recess for accommodating
4 electrical components emanating forwardly of said circuit
5 board.

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1 15. The imaging module of claim 1, further includ^{ing} a
2 pair of aiming light sources, and an aperture plate having a
3 pair of apertured domes disposed over said light sources for
4 shaping light emanating from said aiming light sources.

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1 16. The imaging module of claim 1, wherein said frame
2 includes a back plate, and wherein said at least one
3 illumination source further includes illumination and aiming
4 LED's having leads extending through said back plate and being
5 electrically connected to said circuit board.

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1 17. The imaging module of claim 1, wherein said at least
2 one illumination source further includes illumination and
3 aiming LED's being electrically connected to said circuit
4 board, and wherein said module further comprises:
5 an aperture plate including domes having slit apertures
6 for shaping light emanating from said aiming LED's being fit
7 over said aiming LED's; and
8 a diffuser plate including optics for diffusing light
9 emanating from said illumination LED's being positioned in
10 said optical reader forward of said aperture plate.

1 18. The imaging module of claim 17, further including
2 means adapting said diffuser plate to be snap-fit onto said
3 frame.

1 19. The imaging module of claim 17, further comprising:
2 means adapting said diffuser plate to be snap-fit onto
3 said frame; and
4 means adapting said aperture plate to be biased toward

1 said back plate when said diffuser plate is snap-fit onto said
2 frame.

1 20. An imaging module comprising:
2 a frame;
3 a circuit board mounted to said frame;
4 an image sensor carried by said circuit board; and
5 at least one illumination light source for illuminating a
6 target area.

1 21. The optical reader of claim 20, wherein said at
2 least one illumination light source is mounted to said circuit
3 board, whereby said circuit board carries both of said image
4 sensor and said at least one illumination light source.

1 22. The optical reader of claim 20, wherein said imaging
2 module further includes at least one aiming light source, and
3 wherein said at least one illumination light source and said
4 at least one aiming light source are each mounted to said
5 circuit board, whereby said circuit board carries each of said
6 image sensor, said at least one illumination light source and
7 said at least one aiming light source.

1 23. The optical reader of claim 20, further comprising
2 at least one planar optical component and wherein said frame
3 comprises sidewalls having resilient fingers formed therein
4 for receiving and securing said optical component in said
5 frame in a stationary position in said frame without use of
6 adhesives or any additional mechanical securing apparatuses or
7 agents.

1 24. The optical reader of claim 20, wherein said
2 circuit board carries essentially all image sensor signal
3 processing circuitry, image capture circuitry, and decoding
4 and or recognizing circuitry of an optical reader in which
5 said module is to be installed.

1 25. The optical reader of claim 20, wherein said image
2 sensor is a 2D image sensor and wherein said module further
3 includes at least one aiming light source and associated
4 optics for projecting a solitary horizontal line aiming
5 pattern in a target area.

1 26. The optical reader of claim 20, wherein said frame
2 defines top and side sidewalls of said module, and wherein
3 said sidewalls and said circuit board define a cubic
4 rectangular configuration.

1 27. The optical reader of claim 20, wherein said frame
2 includes substantially rigid top and side sidewalls defining a
3 partially enclosed contained area, and wherein said at least
4 one illumination source is disposed inside said contained
5 area, whereby said at least one illumination source is
6 structurally protected by said frame.

1 28. The optical reader of claim 20, wherein said frame
2 includes substantially rigid top and side sidewalls defining a
3 partially enclosed contained area, and wherein said at least
4 one illumination source and said image sensor are disposed
5 inside said contained area, whereby said at least one
6 illumination source and said image sensor are structurally
7 protected by said frame.

1 29. The optical reader of claim 20, wherein said frame
2 includes substantially rigid top and side sidewalls, and
3 wherein a combination of said circuit board and said top and
4 side sidewalls defines a partially enclosed contained area,
5 and wherein said at least one illumination source is disposed
6 inside said contained area, whereby said at least one
7 illumination source is structurally protected by a combination
8 of said circuit board and said frame.

1 30. The optical reader of claim 20, wherein said frame
2 includes substantially rigid top and side sidewalls and
3 wherein a combination of said circuit board and said top and
4 side sidewalls defines a partially enclosed contained area,
5 and wherein said at least one illumination source and said
6 image sensor are disposed inside said contained area, whereby
7 said at least one illumination source and said image sensor
8 are structurally protected by a combination of said circuit
9 board and said frame.

1 31. The optical reader of claim 29 wherein essentially
2 an entirety of illumination sources of said module are
3 incorporated in said contained area.

1 32. The optical reader of claim A1, wherein said back
2 plate includes a center recess for receiving and aligning said
3 image sensor.

1 33. The optical reader of claim 20, wherein said back

1 plate includes a center recess for receiving and aligning said
2 image sensor and at least one side recess for accommodating
3 electrical components emanating forwardly of said circuit
4 board.

1 34. The optical reader of claim 20, further includes a
2 pair of aiming light sources, and an aperture plate having a
3 pair of apertured domes disposed over said light sources for
4 shaping light emanating from said aiming light sources.

1 35. The optical reader of claim 20, wherein said frame
2 includes a back plate, and wherein said at least one
3 illumination source further includes illumination and aiming
4 LED's having leads extending through said back plate and being
5 electrically connected to said circuit board.

1 36. The optical reader of claim 20, wherein said at
2 least one illumination source further includes illumination
3 and aiming LED's being electrically connected to said circuit
4 board, and wherein said module further comprises:
5 an aperture plate including domes having slit apertures
6 for shaping light emanating from said aiming LED's being fit
7 over said aiming LED's; and
8 a diffuser plate including optics for diffusing light
9 emanating from said illumination LED's being positioned in
10 said optical reader forward of said aperture plate.

1 37. The optical reader of claim 36, further including
2 means adapting said diffuser plate to be snap-fit onto said
3 frame.

1 38. The optical reader of claim 36, further comprising:
2 means adapting said diffuser plate to be snap-fit onto
3 said frame; and
4 means adapting said aperture plate to be biased toward
5 said back plate when said diffuser plate is snap-fit onto said
6 frame.

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